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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,524	02/13/2004	Yong-Kuk Yun	8054-38 (LW9081US/CS)	8916
22150	7590	08/19/2005		
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			EXAMINER TADASSE, YEWEBDAR T	
			ART UNIT	PAPER NUMBER
			1734	

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/779,524

Applicant(s)

YUN ET AL.

Examiner

Yewebdar T. Tadesse

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11, 21, 22 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 21, 22 and 25-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) The invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1, 3-9 and 21 are rejected under 35 U.S.C. 102(a) as being anticipated by Kawase et al (US 6,660,332).

As to claim 1, Kawase et al discloses (see Figs 1-4) an apparatus for forming an organic layer on a substrate (an apparatus for making color filter), having a spraying device comprising a plurality of head units (ink-jet heads 22a-22k) forming in a corresponding row, wherein each head unit includes at least one head (a head) having spraying nozzles (27); and is shifted a horizontal distance from a previous head unit (see a scanning distance  $\delta$  in the scanning direction Y). Kawase et al further discloses (see column 3) spraying nozzles having a pitch between neighboring spraying nozzles and a nozzle pitch ( $L/n$ ) equals to shifting distance (scanning distance  $\delta$ ) divided by  $\cos \theta$ .

As to claim 3, Kawase et al discloses a stage (table 49, see Fig 8) that supports the substrate.

As to claim 4, Kawase et al discloses (see Fig 16) a storage tank (ink supply units 37) that stores organic material provided to the spraying device.

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As to claim 6, Kawase et al discloses (see column 25, lines 29-33) an inkjet head using a piezoelectric device.

As to claims 7-8, Kawase et al discloses (see Fig 1 for an angle  $\theta$ ) ink-jet heads inclined at predetermined angle (capable of being in the range of about  $0^\circ$  to about  $\pm 89^\circ$ ) with respect to a side (second scanning direction) of the substrate.

As to claim 9, Kawase et al discloses (see Fig 8) a transferring device (substrate position controller 18) that transfer the stage (table 49) in a first printing direction and a second printing direction that is opposite to the first printing direction and a third direction that is perpendicular to the first printing direction (a first scanning direction and a second direction perpendicular to the first).

Regarding claim 21, Kawase et al discloses (see Figs 1-4) spraying nozzles arranged in a line (see nozzle line 28).

### ***Claim Rejections - 35 USC § 102/103***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 3-11 and 21 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 0754553 in view of Kawase et al (6,660,332) or Mishima et al (US 6,579,139).

With respect to claim 1, EP'553 discloses (see Fig 24) an apparatus for forming an organic layer on a substrate (a color filter manufacturing apparatus), having a spraying device comprising a plurality of head units (ink-jet heads 120a, 120b, 120c) forming in a corresponding row, wherein each head unit includes at least one head (a head) having spraying nozzles (108); and is shifted a horizontal distance from a previous head unit (see arrows horizontal movements of the heads in Fig 24), wherein the spraying nozzles have a pitch between neighboring spraying nozzles. EP'553

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device is capable of having a multiple of the shift distance of the head units which is identical to the pitch because the pitch or distance between nozzles depends on the desired pixels formed on the substrate. In any event, Kawase et al discloses (see column 3) a nozzle pitch ( $L/n$ ) equals to shifting distance (scanning distance  $\delta$ ) divided by  $\cos \theta$  and Mishima et al discloses (see column 30, lines 18-41) pitch between nozzles equals to a multiple of the shift distance (integer times of the element interval). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the pitch as a multiple of the shift distance of the head units in EP'553 to scan the same section of the substrate in the first direction (see Kawase et al '332; column 2, lines 38-50).

As to claim 3, EP'553 discloses a stage (stage 22, see Fig 11) that supports the substrate.

As to claim 4, EP'553 discloses (see column 23, line 49) a storage tank (ink supply side) that stores organic material provided to the spraying device.

As to claim 6, EP'553 discloses (see column 23, line 46) an inkjet head using a piezoelectric device (pressurizing elements).

As to claims 7-8, EP'553 discloses (see Fig 18) ink-jet heads inclined (tilted) at predetermined angle  $31.672^\circ$  being in the range of about  $0^\circ$  to about  $\pm 89^\circ$  with respect to a side of the substrate.

As to claim 9, EP'553 discloses (see Fig 16) a transferring device (CPU 50 in communication with motors 56, 58 and 59) that transfer the stage (22) in a first printing direction and a second printing direction that is opposite to the first printing direction and

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a third direction that is perpendicular to the first printing direction (a first scanning direction and a second direction perpendicular to the first).

As to claims 10-11, EP'553 discloses (see columns 27-28, starting line 58) a fixed spraying device or the stage is fixed while the spraying devices moving in directions X or Y.

With respect to claim 21, EP'553 discloses (see Fig 19) spraying nozzles (108) arranged in a line.

7. Claims 1-9, 21-22 and 25-28 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kawase (US 2003/0186613) in view of Kawase et al (6,660,332) or Mishima et al (US 6,579,139).

Regarding claims 1-2, Kawase discloses (see Fig 9) an apparatus for forming an organic layer on a substrate (an apparatus for making color filter), having a spraying device comprising a plurality of head units (droplet ejection unit 25A, 25B and 25C) forming in a corresponding row, wherein each head unit includes at least one head (22) having spraying nozzles (27); and is shifted a horizontal distance from a previous head unit (different positions of the ejection Units P21-P26). Kawase further discloses (see Fig 9 and paragraph 158) each head unit comprising a plurality of heads (22) alternatively disposed in first and second sub rows to form a zigzag pattern on the head unit (25), wherein the spraying nozzles have a pitch between neighboring spraying nozzles. Kawase's device is capable of having a multiple of the shift distance of the head units, which is identical to the pitch because the pitch or distance between nozzles

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depends on the desired pixels formed on the substrate. In any event, Kawase et al discloses (see column 3) a nozzle pitch ( $L/n$ ) equals to shifting distance (scanning distance  $\delta$ ) divided by  $\cos \theta$ ; and Mishima et al discloses (see column 30, lines 18-41) pitch between nozzles equals to a multiple of the shift distance (integer times of the element interval). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the pitch as a multiple of the shift distance of the head units in Kawase '613 to scan the same section of the substrate in the first direction (see Kawase et al '332; column 2, lines 38-50).

As to claim 3, Kawase discloses a stage (table 49, see Fig 16) that supports the substrate.

As to claim 4, Kawase discloses (see Fig 1) a storage tank (ink supply units 37) that stores organic material provided to the spraying device.

As to claim 6, Kawase discloses (see paragraph 220) an inkjet head using a piezoelectric device.

As to claims 7-8, Kawase discloses (see Fig 1 for an angle  $\theta$ ) ink-jet heads inclined at predetermined angle of being larger than  $0^\circ$  and smaller than  $90^\circ$  with respect to a side (scanning direction) of the substrate.

As to claim 9, Kawase discloses (see Fig 16, paragraphs 166-168) a transferring device (substrate position controller 18) that transfer the stage (table 49) in a first printing direction and a second printing direction that is opposite to the first printing direction and a third direction that is perpendicular to the first printing direction (a first scanning direction and a second direction perpendicular to the first).



Regarding claim 21, Kawase discloses (see Figs 1-4) spraying nozzles arranged in a line (see nozzle line 28).

With respect to claim 22, Kawase discloses (see Figs 9 and 16) an apparatus for forming an organic layer (an apparatus for making color filter), having a spraying device comprising a plurality of head units respectively disposed in first to nth rows, (droplet ejection unit 25A, 25B and 25C, see three rows on Fig 9), each head unit being shifted by a predetermined distance from a previous head unit (different positions of the ejection Units P21-P26), wherein each head unit including a plurality of heads having spraying nozzles (27); and a transferring device (substrate position controller 18) that transfers the substrate in a printing direction. Kawase further discloses (see Fig 9 and paragraphs 41, 155 and 252) the spraying nozzles (27) arranged in a line (nozzle line 28), and have a pitch between neighboring spraying nozzles. In Kawase the pitch is capable of being identical to n times the predetermined distance because the pitch or distance between nozzles depends on the desired pixels formed on the substrate. In any event, Kawase et al discloses (see column 3) a nozzle pitch ( $L/n$ , wherein n = number of nozzles) equals to shifting distance (scanning distance  $\delta$ ) divided by  $\cos \theta$ , applicant's claimed "n" in Kawase et al's system =  $1/\cos \theta$ ; and Mishima et al discloses (see column 30, lines 18-41) a pitch between nozzles equals to n times predetermined shifting distance (integer times of the element interval). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the pitch as a multiple of the shift distance of the head units in Kawase '613 to scan the same section of the substrate in the first direction (see Kawase et al '332; column 2, lines 38-50).

With respect to claim 25, Kawase discloses (see Fig 9 and paragraph 158) each head unit comprising a plurality of heads (22) alternatively disposed in first and second sub rows to form a zigzag pattern on the head unit (25).

As to claim 26, in Kawase (see Fig 9) the first heads overlaps with adjacent second heads to maintain a uniform distance between droplets of the organic material.

Regarding claim 27, in Kawase (see paragraphs 155, 206 and 209) the spraying device forms an angle with respect to the side of the substrate.

As to claim 28, in Kawase (see Fig 16 and paragraphs 166-168) a first printing direction and a second printing direction that is opposite to the first printing direction and a third direction that is perpendicular to the first printing direction (a first scanning direction and a second direction perpendicular to the first).

8. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawase et al (US 6,660,332) as applied to claim 9 above and further in view of EP 0754553. Kawase et al lacks teaching the spraying device is fixed or stage is fixed while the spraying device is moved in the printing directions. EP'553 discloses (see columns 27-28, starting line 58) a fixed spraying device or the stage is fixed while the spraying devices moving in directions X or Y. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move either the stage or the spraying devices in Kawase et al to form the desired pattern of the organic material on the substrate.

9. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawase (US 2003/0186613) alone or in view of Kawase et al (6,660,332) or Mishima et al (US 6,579,139) as applied to claim 9 above and further in view of EP 0754553.

Kawase lacks teaching the spraying device is fixed or stage is fixed while the spraying device is moved in the printing directions. EP'553 discloses (see columns 27-28, starting line 58) a fixed spraying device or the stage is fixed while the spraying devices moving in directions X or Y. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move either the stage or the spraying devices in Kawase to form the desired pattern of the organic material on the substrate.

### ***Response to Arguments***

10. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kawamura et al (US 6,857,925) discloses (see Fig 15) nozzle head moving a distance equals to multiple of pitch partition.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238. The examiner can normally be reached on Monday-Friday 8:00 AM-4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
YTT

  
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SUPERVISORY PATENT EXAMINER  
Au 1734